Cartilage Tympanoplasty for Management of TM Perforation: A Comparison with the Temporalis Fascia Graft Technique

Authors: Dr Sudhakar Vaidya*, Dr J K Sharma**, Dr Hariom Sharma ***
* Professor & Department Head, **Dean & Professor, *** Resident

Institution: Dept. Of E.N.T. & Head-Neck Surgery, R D Gardi Medical College, Ujjain, India

Corresponding Author:
Dr Sudhakar Vaidya, Professor & Head,
Otolaryngology, RD Gardi Medical College, Ujjain, MP India

Abstract

Introduction: A widely accepted graft material used for tympanoplasty is temporalis fascia. An alternate tissue used for grafting is cartilage, taken either from the tragus or concha. This manuscript is a study which compares outcomes of cartilage tympanoplasty to the temporalis fascia graft technique.

OBJECTIVES: The purpose of the study is to compare the restoration of hearing, postoperatively, in patients who underwent various types of tympanoplasty for eardrum perforation with chronic otitis media (COM) using temporalis and cartilage grafts.

SETTING: Department of Otorhinolaryngology, C R Gardi Hospital, Surasa, Ujjain associated with R D Gardi Medical College, which is a tertiary care hospital of Central India.

Methods: A total number of 100 surgically fit cases of perforation of the tympanic membrane were selected, who needed surgery of either a tympanoplasty or tympanoplasty with mastoidectomy. Study Period: September 2009 to September 2011. In our study of 100 patients, 75 patients presented with chronic otitis media and eardrum perforation and were followed for at least 3 month post operatively. In 39 patients, temporalis fascia grafts were successful and the rest (36 patients) had conchal cartilage grafts. Another 25 patients had presented with atticoantral disease, of these, 11 patients had temporalis fascia grafts and in 14 patients, conchal cartilage grafts and were followed for at least 3 month post operatively.

RESULTS: Our data indicate that cartilage graft with thickness of 0.5 mm achieved TM closure in 100% of the patients and provided satisfying hearing improvement in 80% of the patients, but in the temporalis fascia graft group we achieved TM closure in only 84% of the patients and hearing improvement in 78% of the patients.
Introduction

The most widely accepted material for repair of the tympanic membrane is temporalis fascia because of its availability through the same postaural/endaural incision and with good results. The introduction of cartilage as graft material for tympanoplasty almost debuted at the same time as the temporalis fascia graft and has been shown to be well tolerated with minimal resorption over time. Initially used for ossicular chain reconstruction, cartilage is now used for a wide range of procedures in otology. Cartilage graft tympanoplasty has been successfully used in cases with a high risk of failure. These cases would include near total or total perforations, adhesive middle ear disease, tympanosclerosis and recurrent perforations after tympanoplasty.

There are various methods of cartilage tympanoplasty described by otologists including many new techniques for specific indications, such as the island technique, the palisade technique, the shield technique and the wheel technique. The aim of this study was to evaluate the long-term functional results of primary cartilage tympanoplasty and compare these results to those obtained with primary tympanoplasty using temporalis fascia graft.

Methods

This study on hearing improvement after tympanoplasty using temporalis fascia and conchal cartilage graft in cases of chronic otitis media (COM) with eardrum perforation was done in the Department of Otorhinolaryngology, C R Gardi Hospital, Surasa, Ujjain associated with R. D. Gardi Medical College. R. D. Gardi Medical College is a tertiary care hospital in Central India. The study period was from September 2009 to September 2011. A total of 100 cases of tympanic membrane perforation were selected randomly from the outpatient department. All cases required treatment with either a tympanoplasty or tympanoplasty with mastoidectomy. An additional 25 patients who did not return regularly for postoperative followup during the three-month period were excluded from the study. Selection criteria were patients of both sexes ranging in age from 10 to 60 years who had COM, small, medium, large, subtotal, total and attic perforations, traumatic perforations, atelectatic ear, tympanosclerotic patches and retraction pockets.

Exclusion criteria were patients with all acute serous otitis media (ASOM), otosclerosis, congenital hearing disorder, chronic serous otitis media with mixed or sensorineural hearing loss (SNHL), hearing loss due to serous otitis media, active intracranial complication, patients with history of diabetes mellitus, human immunodeficiency virus and tuberculosis, radical mastoidectomy and patients who did not turn up regularly for followup.

The following parameters were evaluated: Graft survival and perforation closure, postoperative otorrhea, residual perforation, improvement in pure-tone average, improvement in the audiometric air-bone gap and post-operative complications (wound dehiscence, sensorineural hearing loss, perichondritis, facial palsy and any other complication).

Successful graft take up was defined as having no residual perforation, retraction or lateralization. All the patients were observed for any postoperative discharge from the operated ear. In each case, the pre and postoperative pure-tone audiogram was evaluated and pure-tone average improvement at 500, 1,000, and 2,000 Hz was noted. In each case, the improvement in pure-tone audiometry, air bone gap (PTA-ABG) was also calculated in three frequencies (500, 1000 and 2000 Hz) and noted. Improvement in all patients of both
study groups (PTA and PTA-ABG) was calculated to exclude the sensorineural hearing loss occurring during the surgery or postoperative period.

**Outcome failures** were graft failures, reperforation, sensorineural hearing loss, retraction pockets, and perichondritis.

**Patient evaluation and case selection:** All the patients in the study were examined by taking detailed history and clinical ENT Head-Neck examination including tuning fork tests. Examination under the microscope was performed in every case. Any concurrent septic focus in the nose or in the throat was treated. Preoperative pure-tone audiometry (PTA) was done in all patients who were enrolled into the study and recorded in proforma of the study. For all patients x-ray of mastoids was taken of both the ears (Schuler’s view). Preoperative diagnosis and surgical plan of management was formulated. All routine investigations of the patients including Hb, BT, CT, platelet count, blood sugar, serum creatinine and urine (routine and microscopic) were done before the surgery. Then, the patients underwent middle ear surgery under general or local anesthesia. Tympanoplasties were performed, using temporalis fascia and conchal cartilage, in 100 patients (50 with temporalis fascia and 50 with conchal cartilage graft). The selection of the patients for temporalis fascia graft and conchal cartilage graft was done randomly with alternate surgeries applied for the two types of graft.

**Surgical Procedures** were Type I Tympanoplasty, Cortical Mastoidectomy with Type I Tympanoplasty, Cortical Mastoidectomy with Type III Tympanoplasty and Modified Radical Mastoidectomy with Type III Tympanoplasty. For all of the above operations, a standard postaural (William Wilde’s) incision was used. In all the selected patients, tympanoplasty was done. Grafting used was either temporalis fascia or conchal cartilage. We used conchal cartilage graft from the cymba conchae area. The incision used for taking in both the conchal and temporalis fascia graft was the same as the original postaural incision. The cartilage graft was maintained to 0.5 mm thickness by thinning it using a No. 15 surgical blade. Separate knives were used for the skin incision and conchal cartilage graft harvesting. In both the temporalis and cartilage group, the middle ear was filled with pieces of gelfoam to prevent the medialization of the graft. In cartilage tympanoplasty Type I, a cut is made in the cartilage to accommodate the handle of the malleus.

**Enlarged Pictures at End of Document**

[Picture 1. Postaural incision, left ear]
[Picture 2. Harvesting the temporalis fascia graft]
[Picture 3. Harvesting the temporalis fascia graft]
[Picture 4. Temporalis fascia graft]
Postoperative management: A mastoid dressing was applied after the operation and kept up to seven days. IV antibiotics were given and patients were discharged on the second postoperative day. Stitches were removed on the seventh day. The aural pack was removed on the tenth day, ear graft was examined, and topical ear drops were advised.

Follow-up: Every patient was evaluated in an outpatient setting after 15 days, one month, one and half months, two months and three months. On every visit, patients were asked about subjective improvement in hearing and watched for the development of any complications. Audiometric evaluation was made three months after the operation in every patient and recorded (postoperative audiometry at 3 months).

Results

The patients studied belong to varying age groups from the 1st to the 5th decade of life; the youngest patient was a 10 year-old-male and the oldest was a 51-year-old male. The maximum number of patients were in the age group of 21 to 30, i.e., 43% followed by 10 to 20 years, i.e., 33%. The male:female ratio in the present series was 4:6. Number of male patients studied was 40 and total number of female patients studied was 60.

In our present study, 39 patients presented with left ear disease, 33 presented with right ear disease and 28 presented with bilateral ear disease. In our study of a hundred patients, twenty-three patients presented with ear discharge duration between 3 months to three years, 18 patients presented between three years to six years, 15 patients presented with ear discharge between 6 years to nine years, 8 patients presented with drainage for nine to 15 years and 36 patients had a history of ear discharge since childhood. The most common perforation seen was central, in 75% of patients, followed by attic perforation, in 20% and marginal perforations were present in 5% of patients. Sixty percent of patients were in an active stage at the time of surgery, followed 25% who were in an inactive stage and 15% who presented in a quiescent stage.

In our study of 100 patients, 75 patients presented with COM with eardrum perforation. From these, 39 patients had a temporalis fascia graft and 36 patients had a conchal cartilage graft. Of these twenty-five patients presented with atticoantral disease, 11 patients had temporalis fascia grafts, 14 patients had conchal cartilage grafts.
Preoperative pure-tone audiometry was done in all patients (pure-tone average of air conduction was calculated in 500, 1000 and 2000 Hz). Pure-tone average ranged between 25 to 60 dB in the temporalis fascia group. In 2 (4%) patients, pure-tone averages were observed between 25 to 30 dB, 16 (32%) patients presented between 31 to 40 dB pure-tone average, 18 (36%) patients presented between 41 to 50 dB pure-tone average and 14 (28%) patients presented with 51 to 60 dB pure-tone average in the temporalis fascia group.

In the cartilage group, pure-tone averages ranged between 31 to 60 dB, out of which 10 (20%) patients presented between 31 to 40 dB pure-tone average, 22 (44%) patients presented between 41 to 50 dB pure-tone average and 18 (36%) patients presented between 51 to 60 dB pure-tone averages.

In our study of 50 patients with a temporalis fascia graft, 6 (12%) patients presented with an air-bone gap between 14 to 20 dB, 13 (26%) patients presented between 21 to 30 dB, 17 (34%) patients presented between 31 to 40 dB and 14 (28%) patients presented between 41 to 50 dB. In ninety-one patients, surgery was performed under local anesthesia (2% xylocaine with adrenaline with intravenous sedation) and nine were performed under general anesthesia. See Table 1 below:

**Table 1: Procedure done in Temporalis fascia group**

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Procedure</th>
<th>No. of patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Type I tympanoplasty</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>Atticotomy with type I tympanoplasty</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Cortical mastoidectomy with type I tympanoplasty</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>MRM with type I tympanoplasty</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>MRM with type III tympanoplasty</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>6</td>
<td>MRM with type IV tympanoplasty</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

2013 Volume 6(1)
The most common procedure performed was a Modified Radical Mastoidectomy with Type III tympanoplasty in 22 patients (44%) followed by Type I tympanoplasty in 15 patients (30%) in the temporalis fascia group. See Table 2 below:

Table No. 2: Procedure done in cartilage graft group

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Procedure</th>
<th>No. of patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Type I tympanoplasty</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Atticotomy with type I tympanoplasty</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Cortical mastoidectomy with type I tympanoplasty</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Cortical mastoidectomy with type II tympanoplasty</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Cortical mastoidectomy with type III tympanoplasty</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>MRM with type III tympanoplasty</td>
<td>38</td>
<td>76</td>
</tr>
<tr>
<td>7</td>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

The most common procedure performed was a Modified Radical Mastoidectomy with Type III tympanoplasty in 38 patients (76%) followed by Type I tympanoplasty in 5 patients (10%) in the conchal cartilage group.

The temporalis fascia group was followed for 3 months. In 44 (88%) patients, no discharge was present and in 6 (12%) patients discharge was present. In 42 (84%) patients, the tympanic membrane was intact and in 8 (16%) patients residual perforation was present.

The conchal cartilage group was followed for 3 months. In 47 (94%) patients, no discharge was present and in 3 (6%) patients discharge was present. In 50 (100%) patients, the tympanic membrane was intact and no residual perforation was present.

Postoperative pure-tone audiometry was done three months postop in all patients and the pure-tone average was calculated in 500, 1000 and 2000 Hz frequencies. In 5 (10%) patients, the pure-tone average was found between 15 to 20 dB, 15 (30%) patients presented with pure-tone average between 21 to 30 dB, 13 (26%) patients presented with pure-tone average between 31 to 40 dB and 17 (34%) patients presented with pure-tone average between 41 to 60 dB in the temporalis fascia group.
In 2 (4%) patients, the pure-tone average was found between 15 to 20 dB, 8 (16%) patients presented between 21 to 30 dB, 13 (26%) patients presented between 31 to 40 dB, 19 (38%) patients presented between 41 to 50 dB and 8 (16%) patients presented between 51 to 60 dB in the conchal cartilage group.

The postoperative air-bone gap was calculated on all the patients by subtracting the pure-tone average of the bone conduction at 500, 1000 and 2000 hertz frequencies from the pure-tone average of the air conduction at 500, 1000 and 2000 hertz frequencies. The air-bone gap range was between 5 to 51 dB with most of the patients 15 (30%) in the 11 to 20 dB range followed by 11 patients (22%) in the 21 to 30 dB range in the temporalis fascia group. The air-bone gap range was between 5 to 45 dB with most of the patients 17 (42%) in the 31 to 40 dB range followed by 13 patients (26%) in the 21 to 30 dB range in the conchal cartilage group.

In the temporalis fascia group, 18 (36%) patients presented with a 5 to 10 dB improvement in the pure-tone average of air conduction, 16 (32%) patients presented with an 11 to 20 dB improvement in pure-tone average of air conduction, 4 (8%) patients presented with a 21 to 30 dB improvement in pure-tone average of air conduction and 1 (2%) patient presented with a 31 to 40 dB improvement in pure-tone average of air conduction.

In the conchal cartilage group, 27 (54%) patients presented with a 5 to 10 dB improvement in the pure-tone average of air conduction, 11 (22%) patients presented with an 11 to 20 dB improvement in pure-tone average of air conduction and 2 (4%) patients presented with a 21-30 dB improvement in pure-tone average of air conduction.

In the temporalis fascia group, 18 (36%) patients presented with a 5 to 10 dB improvement in the air-bone gap, 16 (32%) patients presented with an 11 to 20 dB improvement, 4 (8%) patients presented with a 21 to 30 dB improvement and 1 (2%) patient presented with a 31 to 40 dB improvement in the air-bone gap.

In the conchal cartilage group, 27 (54%) patients presented with a 5 to 10 dB improvement in the air-bone gap, 11 (22%) patients presented with an 11 to 20 dB improvement and 2 (4%) patients presented with a 21 to 30 dB improvement.

Data can be summarized as follows: Cartilage graft, with a thickness of 0.5 mm, achieved TM closure in almost 100% of patients and provided satisfying hearing improvement in 80% of patients, but in the temporalis fascia graft group we achieved TM closure in only 84% of patients and hearing improvement in 78% of patients. See Table 3 below:
<table>
<thead>
<tr>
<th>Surgery</th>
<th>Temporalsis fascia graft group</th>
<th>Conchlear Cartilage graft group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Improvement</td>
<td>Same</td>
</tr>
<tr>
<td>Type I tympanoplasty</td>
<td>16 dB avg in 15 pt out of 15</td>
<td>Nil</td>
</tr>
<tr>
<td>Atticotomy with type I tympanoplasty</td>
<td>12 dB avg in 1 pt out of 1</td>
<td>Nil</td>
</tr>
<tr>
<td>Cortical mastoidectomy with type I tympanoplasty</td>
<td>15.6 dB average in 6 pt out of 6</td>
<td>Nil</td>
</tr>
<tr>
<td>Cortical mastoidectomy with type II tympanoplasty</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Cortical mastoidectomy with type III tympanoplasty</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>MRM with type I tympanoplasty</td>
<td>10 dB avg in 1 pt out of 1</td>
<td>Nil</td>
</tr>
<tr>
<td>MRM with type III tympanoplasty</td>
<td>9.6 dB avg in 16 pt out of 22</td>
<td>Nil</td>
</tr>
<tr>
<td>MRM with type IV tympanoplasty</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 3: Our Study: Comparison of Cartilage Grafts vs. Temporalsis Fascia for Tympanic Membrane Reconstruction
Discussion

The advantage of the use of cartilage over temporalis fascia cannot be overlooked as its toughness prevents the retraction of the tympanic membrane, but there has been concerns regarding hearing results after the use of this cartilage. Two main reasons why many otologists prefer fascia rather than cartilage are the easier technique of fascia harvesting and the postoperative hearing improvement. Thickness of the cartilage graft certainly will affect the hearing result. However, large cartilage plates with thickness no more than 0.5 mm have been suggested as acceptable and the graft take of this technique has been reported with excellent outcomes.4

There is minimal inflammatory tissue reaction with cartilage. Cartilage tympanoplasty is said to prevent retraction pockets in the tympanic membrane because of its firm support. There is some resistance to infection with cartilage during the healing period. Thus, the risk of recurrent perforation is reduced. In cases of severe eustachian tube dysfunction, cartilage maintains its integrity and resists resorption as well as retraction.5 Cartilage graft has been thought to have a very low metabolic rate, a factor helpful in maintaining intactness of the graft.

It is well known that cartilage has no vessels and receives its blood supply by diffusion from the surface with help of the perichondrium. Histological examination of implanted cartilage removed at revision surgery has demonstrated no major change, except for slight absorption and softening of the cartilage. Cartilage grafts can offer better hearing gain and stability in the long term, which may be of advantage over time.

Conchal cartilage can serve as a means to reconstruct the ossicular chain in cases with an absent incus and a reduced space between the malleus and superstructure of the stapes. In these cases, the cartilage not only repairs the eardrum but adheres to the stapes and also serves as a means of performing an ossiculoplasty.6

A cartilage graft is required, if atticotomy is performed for pars flaccida retraction pocket or cholesteatoma.7 J. Heermann advised in a personal communication to a senior author to use separate knives for taking the skin incision and harvesting the conchal cartilage to avoid possibility of infection of the cartilage.3

Analysis of the studied patients data revealed that, sex and age had no impact on postoperative hearing results. According to the available literature, age has no significant role in the success of tympanoplasty and failure rates are higher in patients below 10 years and above 55 years of age. Hence in our study, the youngest patient was a 10 year-old-male and the oldest a 51-year-old male.

In our study in the temporalis fascia group, followup was done after 3 months and found that in 42 (84%) patients the tympanic membrane graft was intact and in 8 (16%) patients residual perforations were present.

In the conchal cartilage group, after 3 months followup, it was found that in 50 (100%) patients the tympanic membrane was intact and no residual perforation was present. In our study, the overall graft acceptance rate with the cartilage graft is 100%, suggesting that cartilage tympanoplasty is an excellent technique, which is in agreement with the outcome of other studies done by various authors.

Neumann, et al.,8 reported no recurrent perforations, a 100% graft survival and eardrum closure-rate in palisade cartilage tympanoplasty in 29 patients who had been operated on 9 years ago. It has been
proposed that the reason why cartilage is more resistant than the fascia to the changes caused by negative middle ear pressure is because the cartilage receives its nourishment mainly through diffusion and the thickness of the cartilage remains intact and retains its strength to resist negative pressure forces.

A potential drawback of cartilage graft is the graft opacity, as it maybe more difficult to detect eventual residual/recurrent cholesteatoma. However, the fascia is also often not transparent.

Preoperative pure-tone audiometry was done in all patients and pure-tone average of air conduction was calculated using 500, 1000 and 2000 Hz. In 1997, Dornhoffer retrospectively compared the audiometric results of patients who had repair of their eardrum using cartilage (with and without perichondrium) grafting to those who had repair using perichondrium or fascia alone. He found no significant variation in hearing results in the two operative techniques. Hearing improved in the cartilage tympanoplasty group, with a residual PTA air-bone gap of 6.8 dB. This was not a statistically significant difference to the 7.7 dB PTA air-bone gap observed in the perichondrium/fascia group.

In our study, the cartilage group with Type I tympanoplasty had a 17.6 dB average PTA improvement in 5 cases. Two cases with atticotomy with Type I tympanoplasty had a 15 dB average PTA improvement. Two cases with cortical mastoidectomy with Type I tympanoplasty had a 20 dB avg PTA improvement. One case with cortical mastoidectomy with Type II tympanoplasty had a 5 dB PTA improvement. Two cases with cortical mastoidectomy with Type III tympanoplasty had a 7 dB PTA improvement. Out of 38 MRM with Type III tympanoplasty cases, 28 had a 7.7 dB avg. PTA improvement, in 3 cases no hearing improvement was noted and in 7 cases there was a deterioration of 5.4 dB average PTA.

In our study, the temporalis fascia graft group with Type I tympanoplasty had a 16 dB average PTA improvement in 15 cases. In one case with atticotomy with Type I tympanoplasty, the patient had a 12 dB improvement. Six cases with cortical mastoidectomy with Type I tympanoplasty had a 15.6 dB average PTA improvement. One case with MRM with Type I tympanoplasty had a 10 dB average PTA improvement. Out of 22 MRM with Type III tympanoplasty cases, 16 had a 9.6 dB avg. PTA improvement, and in 6 cases there was a deterioration of 4.3 dB average PTA. Five cases with MRM with Type IV tympanoplasty had 8.4 dB average PTA deterioration. This study corroborates Dornhoffer’s results by demonstrating overall hearing improvement after cartilage tympanoplasty which is comparable to temporalis fascia grafting. See Table 4 below:
<table>
<thead>
<tr>
<th>Comparator group</th>
<th>Outcome</th>
<th>Comment</th>
</tr>
</thead>
</table>
| 20 fascia/ perichondrium tympanoplasties for perf >25% TM size or atelectasis cases **Dornhoffer**\textsuperscript{12,13} | Cartilage group: no residual perforation, OME in 3 cases (13.6%), mean ABG = 6.8 dB
Fascia/perichondrium group: residual perforations in 3 cases (15%), mean ABG = 7.7 dB | Number of cases too small for a case–control study. The Author claimed that amount of cartilage used in reconstruction did not adversely affect hearing. |
| 50 underlay temporalis fascia group + 50 cartilage group (our study)         | Temporalis fascia graft group:
Type I tympanoplasty-16 dB PTA improvement, Atticotomy with type I tympanoplasty-12 dB improvement, MRM with type III tympanoplasty-9.6 dB improvement in % cases, 4.3 dB deteriorates in % cases.
Cartilage group: Type I tympanoplasty-17.6 dB PTA improvement, Atticotomy with type I tympanoplasty-15 dB improvement, MRM with type III tympanoplasty-7.7 dB avg PTA improvement in 28 cases, in 3 case same hearing and 5.4 dB avg PTA deteriorates in 7 cases. | No residual perforation in conchal cartilage group but in 16% cases of temporalis fascia group there was residual/recurrence of perforation |

Table 4: Cartilage Grafts vs. Conventional Materials For Tympanic Membrane Reconstruction. (Comparison of our study with Dornhoffer\textsuperscript{12,13} study.)
Conclusion

The primary objective of middle ear and mastoid surgery for cases of COM with perforation is the eradication of chronic otorrhea and to achieve a dry ear, postoperatively. Improvement in hearing is also a desirable benefit in addition to the primary aim. The main aim of this study is to compare the restoration of hearing, postoperatively, in patients who underwent various types of tympanoplasty for COM using temporalis and cartilage grafts. It has been established by this study that tympanoplasty with cartilage graft has a high degree of graft take. Tympanoplasty with conchal cartilage provides better results in terms of integrity and intactness of the graft and less percentage of postoperative discharge from the operated ear after three months of follow-up. Type I tympanoplasty and atticotomy with Type I tympanoplasty using conchal cartilage, has given better hearing results to patients with COM, both in terms of discharge-free ear and improvement of hearing.

Hearing is improved even if a mastoidectomy is required for the patients. Cortical mastoidectomy with Type I tympanoplasty has alleviated patients' misery and the improvement of hearing was better in cases where conchal cartilage was used. In MRM with Type III tympanoplasty cases, a greater percentage of the patients had hearing improvement than in the temporalis fascia group. It has also been noted, that the postoperative appearance of the tympanic membranes using temporalis fascia was better than cartilage graft patients. Our data indicate that cartilage graft with thickness of 0.5 mm achieved TM closure in 100% of the patients and provided satisfying hearing improvement in 80% of the patients, but in the temporalis fascia graft group we achieved TM closure in only 84% of the patients and hearing improvement in 78% of the patients.

Though the choice of graft material is dependent on the surgeon's skill and experience, condition of the ossicular chain, the size of the perforation, and the presence of cholesteatoma, cartilage tympanoplasty gives ENT surgeons a reliable armamentarium in tympanoplasties. Despite its rigid nature, cartilage tympanoplasty delivers an excellent audiologic outcome comparable to temporalis fascia graft.

Acknowledgement

The authors are very much thankful to Dr. V. K. Mahadik, Medical Director of R. D. Gardi Medical College, Ujjain (MP) for providing useful guidance, facilities and excellent manpower and also for permission to publish this article.

References


3. Professor Joachim Heermann (Essen, Germany): personal communication to Dr Sudhakar Vaidya.1997.

2013 Volume 6(1)
   View Abstract

   View Abstract

   View Abstract

   View Abstract

   View Abstract

   View Abstract


   View Abstract

   View Abstract

   View Abstract